

IN THE CLAIMS:

1. (original) An assembly of a lubricant injector and a connector, said connector comprising a body having an injector-engaging face, said lubricant injector comprising a body having an inlet for lubricant under pressure, an outlet, a measuring chamber for receiving lubricant from the inlet, a piston movable through a stroke in the measuring chamber for the discharge of a measured volume of lubricant from the measuring chamber and thence through the outlet, and a valve responsive to pressure conditions in the inlet for operation of the injector in cycles in each of which the injector starts in a state of repose wherein pressure of lubricant in the inlet is relieved and the measuring chamber is charged with lubricant, progresses through a state wherein lubricant under pressure is delivered to the injector via the inlet for the discharge, and ends in a state for venting the injector to effect recharging of the measuring chamber involving the transmission of lubricant from the inlet to the measuring chamber,

said injector body having an elongate form with a face engaging said face of the connector body and detachably fastened thereon, the inlet of the injector being constituted by a chamber in the injector body adjacent one end thereof and an inlet passage extending from said face of the injector body to said inlet chamber, the outlet of the injector being constituted by an outlet passage extending from within the injector body to said face of the injector intermediate said inlet passage and the other end of the injector body, said connector body having lubricant supply passaging therein in

communication at said faces with said inlet passage in the injector, said connector body further having lubricant outlet passaging therein in communication at said faces with the outlet passage of said injector.

2. (original) An assembly of a lubricant injector and a connector,
said connector comprising a body having an injector-engaging face,
said lubricant injector comprising a body having an inlet for lubricant under pressure from a supply, an outlet, a measuring chamber for receiving lubricant from the inlet, a piston movable through a stroke in the measuring chamber for discharging a measured volume of lubricant therefrom, said injector having passaging for transmission of lubricant from the inlet to the measuring chamber and transmission of lubricant from the measuring chamber to the outlet, a valve movable between a first position for the transmission of lubricant from the inlet to the measuring chamber and blocking the transmission of lubricant from the measuring chamber to the outlet and a second position for blocking the transmission of lubricant from the inlet to the measuring chamber and for the transmission of lubricant from the measuring chamber to the outlet, said valve being biased to move from its second to its first position and responsive to certain pressure of lubricant in the inlet to overcome the bias and move from its first to its second position, said injector being operable in cycles each of which involves the injector initially being in a first state due to relief of pressure in the inlet, in which state the valve is in first position and the measuring chamber is charged with

lubricant, the injector progressing to a second state on increase of pressure in the inlet sufficient to overcome the bias and move the valve to its second position, then progressing to a third state upon further increase in pressure in the inlet for discharging said volume, and finally a fourth state upon drop of pressure in the inlet wherein the valve is in its first position for venting the injector to effect recharging of the measuring chamber involving the transmission of lubricant from the inlet to the measuring chamber,

said injector body having an elongate form with a face engaging said face of the connector and detachably fastened thereon, the inlet of the injector being constituted by a chamber in the injector body adjacent one end thereof and an inlet passage extending from said face of the injector body to said inlet chamber, the outlet of the injector being constituted by an outlet passage extending from within the injector body to said face of the injector intermediate the said inlet passage and the other end of the injector body, said connector body having lubricant supply passaging therein in communication at said faces with said inlet passage in the injector, said connector body further having lubricant outlet passaging therein in communication at said faces with the outlet passage of said injector.

3. (original) An assembly of a lubricant injector and a connector,
said connector comprising a body having an injector-engaging face,

said lubricant injector comprising a body having a differential cylinder therein, a differential piston slidable forward in the cylinder from a retracted position establishing a measuring chamber for a charge of lubricant on the forward side of the piston and a pressure chamber of smaller cross-sectional area than the measuring chamber on the rearward side of the piston, said piston being movable forward from retracted position through a stroke for discharging a measured volume of lubricant from the measuring chamber and rearward back to retracted position for the recharging of said measuring chamber, said injector being operable in cycles for discharging said measured volume on each cycle and then recharging said measuring chamber and holding the charge for the next cycle, said body having an inlet for lubricant under pressure, an outlet for the discharge, primary passaging for the transmission of lubricant under pressure from said measuring chamber to the outlet for the discharge of said volume and for transmission of lubricant under pressure from the inlet to the measuring chamber for the charging thereof with lubricant under pressure, said body further having auxiliary passaging for transmission of lubricant under pressure from the inlet to the pressure chamber and back from the pressure chamber, a valve movable in the body between a first position wherein it opens said primary passaging for charging said measuring chamber and blocks said primary passaging from discharging said volume and a second position wherein it blocks said primary passaging against recharging said measuring chamber and opens said primary passaging for discharge of said volume from said measuring chamber, said valve being biased to move from its second to its first position and being

movable from its first to its second position in response to increase in the pressure of lubricant in the inlet, said injector being in a first state, namely, a state of repose, when inlet pressure is in relief, the valve being in its first position, the measuring chamber then holding a charge of lubricant under pressure and the differential piston being in retracted position, the pressure chamber being in communication with the inlet, a second state when inlet pressure increases sufficiently to overcome the valve bias and move the valve to second position, then progressing to a third state upon further increase in pressure in the inlet for discharging said measured volume, and finally a fourth state upon drop in pressure in the inlet wherein the valve is in its first position for venting the injector for the recharge of the measuring chamber involving the transmission of lubricant from the inlet to the measuring chamber,

said injector body having an elongate form with a face engaging said face of the connector and detachably fastened thereon, the inlet of the injector being constituted by a chamber in the injector body adjacent one end thereof and an inlet passage extending from said face of the injector body to said inlet chamber, the outlet of the injector being constituted by an outlet passage extending from within the injector body to said face of the injector intermediate the said inlet passage and the other end of the injector body, said connector body having lubricant supply passaging therein in communication at said faces with said inlet passage in the injector, said connector body further having lubricant outlet passaging therein in communication at said faces with the outlet passage of said injector.

4. (currently amended) An assembly of a lubricant injector and a connector, said connector comprising a body having an injector-engaging face, said lubricant injector comprising an elongate body having a longitudinal axis, a differential cylinder extending longitudinally of the body on said axis adjacent one end, said differential cylinder having first and second sections with the second section of smaller cross-sectional area than the first section and extending from the first section in the direction toward the other end of the body, a differential piston having first and second sections sealingly slidable in respective first and second sections of the differential cylinder, the first section of the cylinder providing a measuring chamber and the second providing a pressure chamber, an inlet in the other end of the body for the entry of lubricant under pressure from a supply line, an elongate discharge chamber in the body in line with the differential cylinder, an outlet extending from the discharge chamber, a bore extending from the discharge chamber to the inlet, a dual charging and discharging passage extending lengthwise in the body and communicating with the measuring chamber, a first transverse passage communicating with the dual passage and said bore, a second transverse passage communicating with the dual passage and said bore, a second lengthwise passage extending from the inlet to the pressure chamber and communicating with said ~~dual passage~~ second transverse passage, a slide valve slidable in the bore subject to pressure of lubricant in the inlet, said slide valve having a passage therein extending to said discharge chamber and being slidable

between first and second positions, said slide valve being formed for blocking said first transverse passage and establishing communication between said second ~~transverse~~ lengthwise passage and the ~~passage in the valve~~ dual passage in the first position and blocking said second transverse passage and establishing communication between the first transverse passage and the passage in the valve in the second position, at least one coil compression spring in said discharge chamber biasing the valve to move from second to first position, the valve being movable by pressure in the inlet from its first to its second position,

said injector body having an elongate form with a face engaging said face of the connector and detachably fastened thereon, the inlet of the injector being constituted by a chamber in the injector body adjacent one end thereof and an inlet passage extending from said face of the injector body to said inlet chamber, the outlet of the injector being constituted by an outlet passage extending from within the injector body to said face of the injector intermediate the said inlet passage and the other end of the injector body, said connector body having lubricant supply passaging therein in communication at said faces with said inlet passage in the injector, said connector body further having lubricant outlet passaging therein in communication at said faces with the outlet passage of said injector.

5. (canceled)

6. (original) An assembly comprising a plurality of injectors and a manifold, said manifold comprising an elongate block having an injector-engaging face, a plurality of injectors, each comprising a body having an inlet for lubricant under pressure, an outlet, a measuring chamber for receiving lubricant from the inlet, a piston movable through a stroke in the measuring chamber for the discharge of a measured volume of lubricant from the measuring chamber and thence through the outlet, and a valve responsive to pressure conditions in the inlet for operation of the injector in cycles in each of which the injector starts in a state of repose wherein pressure of lubricant in the inlet is relieved and the measuring chamber is charged with lubricant, progresses through a state wherein lubricant under pressure is delivered to the injector via the inlet for the discharge, and ends in a state for venting the injector to effect recharging of the measuring chamber involving the transmission of lubricant from the inlet to the measuring chamber,

the body of each injector having a face engaging with said face of the manifold and detachably fastened thereon, the inlet of each injector being constituted by a chamber in the injector body adjacent one end thereof and an inlet passage extending from said face of the injector to said inlet chamber, the outlet of each injector being constituted by an outlet passage extending from within the injector body to said face of the injector intermediate the said inlet passage and the other end of the injector body, said manifold body having lubricant supply passaging therein in communication at said faces with said inlet passages, said manifold body further having lubricant outlet

passaging therein in communication at said faces with the outlet passages of said injectors.

7. (original) An assembly comprising a plurality of injectors and a manifold, said manifold comprising an elongate block having an injector-engaging face, a plurality of injectors, each comprising a body having an inlet for lubricant under pressure from a supply, an outlet, a measuring chamber for receiving lubricant from the inlet, a piston movable through a stroke in the measuring chamber for discharging a measured volume of lubricant therefrom, said injector having passaging for transmission of lubricant from the inlet to the measuring chamber and transmission of lubricant from the measuring chamber to the outlet, a valve movable between a first position for the transmission of lubricant from the inlet to the measuring chamber and blocking the transmission of lubricant from the measuring chamber to the outlet and a second position for blocking the transmission of lubricant from the inlet to the measuring chamber and for the transmission of lubricant from the measuring chamber to the outlet, said valve being biased to move from its second to its first position and responsive to certain pressure of lubricant in the inlet to overcome the bias and move from its first to its second position, said injector being operable in cycles each of which involves the injector initially being in a first state due to relief of pressure in the inlet, in which state the valve is in first position and the measuring chamber is charged with lubricant, the injector progressing to a second state on increase of pressure in the inlet

sufficient to overcome the bias and move the valve to its second position, then progressing to a third state upon further increase in pressure in the inlet for discharging said volume, and finally a fourth state upon drop of pressure in the inlet wherein the valve is in its first position for venting the injector to effect recharging of the measuring chamber involving the transmission of lubricant from the inlet to the measuring chamber,

the body of each injector having a face engaging said face of the manifold and detachably fastened thereon, the inlet of each injector being constituted by a chamber in the injector body adjacent one end thereof and an inlet passage extending from said face of the injector to said inlet chamber, the outlet of each injector being constituted by an outlet passage extending from within the injector body to said face of the injector intermediate the said inlet passage and the other end of the injector body, said manifold body having lubricant supply passaging therein in communication at said faces with said inlet passages, said manifold body further having lubricant outlet passaging therein in communication at said faces with the outlet passages of said injectors.

8. (original) An assembly comprising a plurality of injectors and a manifold, said manifold comprising an elongate block having an injector-engaging face, a plurality of injectors, each comprising a body having a differential cylinder therein, a differential piston slidable forward in the cylinder from a retracted position establishing a measuring chamber for a charge of lubricant on the forward side of the

piston and a pressure chamber of smaller cross-sectional area than the measuring chamber on the rearward side of the piston, said piston being movable forward from retracted position through a stroke for discharging a measured volume of lubricant from the measuring chamber and rearward back to retracted position for the recharging of said measuring chamber, said injector being operable in cycles for discharging said measured volume on each cycle and then recharging said measuring chamber and holding the charge for the next cycle, said body having an inlet for lubricant under pressure, an outlet for the discharge, primary passaging for the transmission of lubricant under pressure from said measuring chamber to the outlet for the discharge of said volume and for transmission of lubricant under pressure from the inlet to the measuring chamber for the charging thereof with lubricant under pressure, said body further having auxiliary passaging for transmission of lubricant under pressure from the inlet to the pressure chamber and back from the pressure chamber, a valve movable in the body between a first position wherein it opens said primary passaging for charging said measuring chamber and blocks said primary passaging from discharging said volume and a second position wherein it blocks said primary passaging against recharging said measuring chamber and opens said primary passaging for discharge of said volume from said measuring chamber, said valve being biased to move from its second to its first position and being movable from its first to its second position in response to increase in the pressure of lubricant in the inlet, said injector being in a first state, namely, a state of repose, when inlet pressure is in relief, the valve being in its

first position, the measuring chamber then holding a charge of lubricant under pressure and the differential piston being in retracted position, the pressure chamber being in communication with the inlet, a second state when inlet pressure increases sufficiently to overcome the valve bias and move the valve to second position, then progressing to a third state upon further increase in pressure in the inlet for discharging said measured volume, and finally a fourth state upon drop in pressure in the inlet wherein the valve is in its first position for venting the injector for the recharge of the measuring chamber involving the transmission of lubricant from the inlet to the measuring chamber,

the body of each injector having a face engaging said face of the manifold and detachably fastened thereon, the inlet of each injector being constituted by a chamber in the injector body adjacent one end thereof and an inlet passage extending from said face of the injector to said inlet chamber, the outlet of each injector being constituted by an outlet passage extending from within the injector body to said face of the injector intermediate the said inlet passage and the other end of the injector body, said manifold body having lubricant supply passaging therein in communication at said faces with said inlet passages, said manifold body further having lubricant outlet passaging therein in communication at said faces with the outlet passages of said injectors.

9. (currently amended) An assembly comprising a plurality of injectors and a manifold,

said manifold comprising an elongate block having an injector-engaging face,

a plurality of injectors, each comprising an elongate body having a longitudinal axis, a differential cylinder extending longitudinally of the body on said axis adjacent one end, said differential cylinder having first and second sections with the second section of smaller cross-sectional area than the first section and extending from the first section in the direction toward the other end of the body, a differential piston having first and second sections sealingly slidable in respective first and second sections of the differential cylinder, the first section of the cylinder providing a measuring chamber and the second providing a pressure chamber, an inlet in the other end of the body for the entry of lubricant under pressure from a supply line, an elongate discharge chamber in the body in line with the differential cylinder, an outlet extending from the discharge chamber, a bore extending from the discharge chamber to the inlet, a dual charging and discharging passage extending lengthwise in the body and communicating with the measuring chamber, a first transverse passage communicating with the dual passage and said bore, a second transverse passage communicating with the dual passage and said bore, a second lengthwise passage extending from the inlet to the pressure chamber and communicating with said ~~dual passage~~ second transverse passage, a slide valve slidable in the bore subject to pressure of lubricant in the inlet, said slide valve having a passage therein extending to said discharge chamber and being slidable between first and second positions, said slide valve being formed for blocking said first transverse passage and establishing communication between said second ~~transverse~~ lengthwise passage and the ~~passage in the valve~~ dual passage in the first position and

blocking said second transverse passage and establishing communication between the first transverse passage and the passage in the valve in the second position, at least one coil compression spring in said discharge chamber biasing the valve to move from second to first position, the valve being movable by pressure in the inlet from its first to its second position,

the body of each injector having a face engaging said face of the manifold and detachably fastened thereon, the inlet of each injector being constituted by a chamber in the injector body adjacent one end thereof and an inlet passage extending from said face of the injector to said inlet chamber, the outlet of each injector being constituted by an outlet passage extending from within the injector body to said face of the injector intermediate the said inlet passage and the other end of the injector body, said manifold body having lubricant supply passaging therein in communication at said faces with said inlet passages, said manifold body further having lubricant outlet passaging therein in communication at said faces with the outlet passages of said injectors.

10. (canceled)